DOCUMENT RESUME

ED 288 809 SP 028 819

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TITLE "Healthful P.E." Albuquerque Public Schools--Lovelace Physical Fitness Pilot Program and "Healthful P.E." Evaluation Update.
INSTITUTION Albuquerque Public Schools, N. Mex.
PUB DATE Nov 86
NOTE 36p.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Cooperative Programs; Health Education; *Life Style; *Physical Education; *Physical Fitness; *Program Effectiveness; Program Evaluation; School Districts; Secondary Education; *Student Improvement
IDENTIFIERS Albuquerque Public Schools NM

ABSTRACT

Results of two evaluations of a 3-year physical fitness pilot program, developed by the Lovelace Medical Foundation and the Albuquerque Public Schools to upgrade the health and physical fitness status of adolescent students, are presented. Adolescent risk factors addressed by the project are discussed, including smoking, substance abuse, poor nutrition, stress, inadequate exercise, and lack of health knowledge. The program's various course offerings are also detailed as well as evaluation components. Positive scores in terms of student reaction, parent reaction, increased health knowledge, fitness, and blood chemistry are noted. Implications for the program's future are discussed. (CB)

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N O V E M B E R , 1 9 8 6

ADMINISTRATIVE SUMMARY

The collective resources of the Lovelace Medical Foundation and the Albuquerque Public Schools are being pooled in a three-year pilot program to upgrade the health and physical fitness status of Albuquerque's teenagers. It is now established that lifestyles formed early determine health habits in adulthood. The proponents of this program hope to arrive at successful intervention techniques to prevent certain behavioral risk factors from jeopardizing our youths' future well-being. They began the program with three physical education classes, one at each high school site, during the 1986 summer session. After the project is completed and evaluated in 1988, components of the program will be considered for incorporation into the required high school physical education course.

The following results are presented as preliminary findings from the first year. On surveys completed at the end of the program, pilot students indicated more enjoyment of, and fitness learning from, their summer course than did comparison group PE students at each site. They also expressed the belief that "learning about fitness" and "practicing fitness activities" should comprise about two-fifths of the physical education curriculum. The average comparison group student would earmark about one-fifth of PE time to these intents.

Both pilot and comparison groups showed marked improvement on the health-related fitness assessment, moving from "below average" to "average" from pre-test to post-test. Although the pilot students showed more growth, the difference in gain was not found to be statistically significant. Another administration of this test is planned for May, 1987, to assess the fitness retention of both groups.

The Scott-Foresman Health Test was administered to both groups to obtain a measure of health/physical fitness concept knowledge. Despite relatively high pre-test scores, both groups still showed some gain. Pilot teachers do not feel that the test is congruent with the curriculum. A teacher-made instrument, specifically addressing the objectives of the pilot project, might prove to be a better measure of the concepts learned during subsequent summer sessions.

The Rhode Island Teen Wellness Check was administered, as well, to both groups to obtain a self-reported measure of selected health risk factors and behaviors. Students reported some improvement in these areas, too.

Blood chemistry tests were done at the beginning and end of the program for most of the pilot students. Varying results indicate that high risk adolescents may require different interventions than those which seem useful for "normal" teenagers. Student-teacher contracts featuring individualized objectives are being considered as one means of focusing attention on certain risk factors with certain students.

Since the teachers and administrators involved in this ongoing pilot were highly involved in the preliminary analysis, it was deemed unnecessary to formalize many conclusions and suggestions at this juncture. Planning for next summer's effort, incorporating several new ideas, has already begun.

"He says fitness is a state of mind. So he sits there thinking about exercise."

APS - LOVELACE PHYSICAL FITNESS PILOT PROGRAM

Introduction

The primary objective of the APS - Lovelace Physical Fitness Pilot Program has been to bring resources of the Albuquerque Public Schools and Lovelace Medical Foundation together to help elevate the health and physical fitness status of Albuquerque's school age population through the development of an educational program aimed at directing and promoting positive health-related behavior. These resources were marshalled in the belief that early education and intervention will generate long-term patterns resulting in improved life-long health/physical fitness habits and health status.

In recent years concern has been expressed, by many educators and parents, over the APS summer school version of the required high school physical education course because its emphasis has been on non-aerobic recreational activities. The district physical education evaluation study, completed a year ago, pointed to the need for more physical fitness concepts and exercises during the regular term offering as well. Program personnel feel that current efforts are unlikely to yield long-lasting impacts on health attitudes and behaviors. The education and research units of the Lovelace Medical Foundation graciously offered considerable time and $11,500 in funding to pilot a "Healthful P.E." summer program with the Albuquerque Public Schools.

The project is a three-year program with the first phase completed this past summer. After the project is completed and evaluated in 1988, components of the program will be considered for incorporation into the required high school physical education course. The following results are presented as preliminary findings from the first year.

BACKGROUND: ADOLESCENT RISK FACTORS

A brief review of the literature will illustrate the philosophical underpinning of this project. It is widely accepted that the onset of disease and disability occurs early in life (Berenson and Epstein, 1983; Blackburn et al., 1979; Frank et al., 1985; Freedman et al., 1985; Tamir et al., 1981; Linder and DuRant, 1982; Miller, 1985; and Wynder et al., 1983). Lifestyles formed early determine health habits in adulthood (Healthy People, 1979). Behavioral risk factors for adolescents are basically the same as those for adults (e.g. smoking, abuse of various substances, obesity, poor nutrition habits, stress, hyperlipidemia and hypercholesterolemia, lack of health knowledge, insufficient exercise, and other factors that lead to morbidity and mortality). The difference between the two populations exists mainly in the stage and degree of development. Risks such as those listed above are especially important because of their implications for future well-being (Morris, 1980). Once these characteristics are ingrained during adolescence, they are very difficult to alter thereafter.

Many of the risk factors of cardiovascular disease are largely determined or influenced by lifestyle or environmental factors (Linder and DuRant, 1982). As many as forty percent of U.S. adolescents are now estimated to have, already present, one or more of the risk factors associated with heart disease: overweight, high blood pressure, high blood cholesterol, cigarette smoking, lack of exercise, or diabetes (Healthy People, 1979).

Because many habits and lifestyle patterns evident in adolescence have pronounced implications for future well-being, health-related interventions are important in this age group. Effective implementation of preventive measures requires more than knowledge. Social support, resources, motivation and the

teaching and practice of appropriate skills are needed in order to improve the health status of adolescents. A program incorporating these components not only could help to prevent the onset of disease and disability but is likely to increase the fitness status of its participants.

WIZARD OF ID
YOUR TEETH ARE IN TERRIBLE SHAPE! HOW DID THEY GET THIS WAY?
...IT'S SPORTS RELATED
YOU'RE AN ATHLETE?
NO... I'VE COLLECTED OVER TWENTY THOUSAND BASEBALL CARDS

THE PROGRAM

The pilot program emphasized students' direct involvement in their own health promotion through the acquisition of health-related skills and knowledge and the subsequent practice of these concepts in field experiences.

Coordinated efforts by several community resources offered the students an opportunity for a synergistic effect of promoting health. The program focused on facilitating and reinforcing the students' inclination to acquire positive health behaviors that they could carry into adult life.

Six physical fitness classes, made up of 156 ninth through twelfth graders at the summer school sites at Del Norte, Manzano and Valley High Schools, were self-selected into three experimental and three comparison classes. Participation in the program was strictly voluntary; the choice was provided at summer school registration.

Students in the pilot group differed significantly from the comparison group in age and grade level. This was due to some "recruitment" of younger students for the pilot under the assumption that working with younger students might be more effective in promoting long-term positive health-related change. It appeared less likely that younger students would have incorporated negative health behaviors into their lifestyles and more likely that they would be malleable. Since summer school registration is open to all high school students who need physical education credit, the comparison classes consisted of a higher proportion of older students who chose the traditional class.

More girls than boys tend to opt for physical education during the summer. While girls made up 54% of the comparison group, they represented 67% of the pilot population.

The pilot sites averaged 25 students per teacher while the comparison mean was 27; there have been up to 50 students per class during previous summers. Teachers who had previously taught summer physical education felt that reduced size of class was a major factor in the strides made by both pilot and comparison classes.

Three well-regarded teachers, with credentials and experience in both physical education and health instruction, were hired in the spring to help create and implement the program. Their quality, ironically, presents some impediments in assessing the pilot. It is difficult to delineate how much credit to attribute to the merits of the curriculum versus how much to ascribe to preeminent teaching.

The six week program, with daily sessions (Monday through Friday) of four hours, was divided into sections, each of which addressed health-related areas

of adolescence. Information and skills were presented and applied to health-related behaviors. Areas covered by the program included: components of fitness; wellness concepts; health knowledge; hypokinetic disease and conditions; threshold training and target zones of exercise; muscular endurance and strength; flexibility; body composition and chemistry; individual and group aerobic and anaerobic activities; alcohol and substance abuse; stress; and nutrition. Students applied and practiced the elements in various activities.

"We learned about bones and teeth today. Can I have a bowl of calcium?"

The comparison group classes participated in the traditional summer school physical education curriculum offered by APS, during the same timeframe. Included in these classes were the teaching and practice of physical activities (aerobic, anaerobic and team sports).

Evaluation components were incorporated into the curriculum, not only to collect information, but also to be used as teaching tools. Pre and post knowledge tests, physical fitness measures and health risk appraisals were included in the experimental and comparison groups' programs. Additional pre and post blood chemistry diagnoses were done for the pilot classes in order to obtain measures and identify certain adolescent health risks.

RESULTS

Student Impressions

Some of the most favorable information about the program came in the form of feedback from the students. Visits to the pilot sites manifested teenagers enjoying, and remarkably engrossed in, the activities. In addition, an adaptation of the student survey form that had been used in the district physical education evaluation was administered at the end of the program to both pilot and comparison groups, and the differences in response are quite revealing.

Students in both groups were asked to indicate how time SHOULD be divided among eight specified categories of physical education activities. The average pilot student response allocated 38% of P.E. time to "learning about fitness" and "practicing fitness activities." The average comparison group student earmarked 21% of such hours to these intents.

How much do students feel they learn about fitness in a six-week summer school course? Seventy-five percent (75%) of the pilot students selected "a lot" from among the choices; only 28% of the comparison group students picked that option. And, while 14% of the comparison group signified that they had learned "very little" or "nothing" about fitness, there were no pilot students choosing those options.

How did the two groups of students feel about their summer experience? Three out of every five pilot students (59%) specified that they either "liked it a lot" or felt "it's the best class I've ever taken" (24%). Fewer than half of the comparison group (42%) picked either of these two options, with only one of

every eight (12%) saying "it's the best. . . ever." When asked what they liked best about their physical education class, the pilot group had two items in their top five which were not "ranked" by the comparison group: "The teacher" (mentioned without prompting by 13 pilot students) and "learned a lot" (10). While "running" was the item disliked most by both groups, it was enlightening that the comparison group's second element of antipathy: "getting up early" was not mentioned by a single pilot student. Two-thirds (66%) of the pilot group would "definitely" recommend summer school P.E. to friends as a preferred option to taking the required course during the regular semester; a few more than half (54%) of the comparison group would so advise.

Parent Feedback

While parent involvement and participation did not match initial aspirations, virtually all comments from pilot students' parents were quite complimentary. District officials noted that there have been some strong complaints from parents in past years about the educational value of the "traditional" summer physical education offering. Such criticism was conspicuously absent in regard to the pilot program.

"What did I learn today? My mother will want to know."

10/82

Fitness Test

Both groups were pre and post-tested with the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD) health-oriented fitness assessment. The mean fitness score is a composite of the various measures (weight, sit and reach, sit-ups, skinfold measurement, and time required to complete a 1.5 mile run).

National norms for measurement of total physical fitness from the test results are: 234+ = excellent; 211-233 = above average; 191-210 = average; 167-190 = below average; 0-166 = well below average. Both groups shifted from below average to average from pre-test to post-test. Pilot students showed a mean fitness score increase of 18.2, as contrasted to 10.1 for the comparison group (see Table 1).

Table 1

TOTAL FITNESS SCORES

	Comparison Group (N = 59)		Pilot Group (N = 67)	
	Pre	Post	Pre	Post
Mean fitness score	187.7	197.8	184.1	202.3
Change in score	+10.1		+18.2	

Although the pilot students showed more growth, the difference in gain was not found to be statistically significant. Another administration of this test is planned for May, 1987, to assess the fitness retention of both groups.

Regular term high school P.E. classes are beginning this year to collect pre-post health-related fitness data. Future evaluations will also compare summer pilot growth to regular term improvement.

Further analysis was conducted on each of the subtests: skinfold measures, sit and reach as well as sit-up scores and 1.5 mile run time. Both groups experienced significant improvement from pre to post measurement in all areas, except in skinfold, where only the experimental students exhibited significant change. Although both groups demonstrated significant progress, the experimental groups' differences on measures of cardiovascular fitness were more pronounced than the comparison groups'. The amount of these differences were not, however, statistically significant. It should be noted that comparison group classes also considered fitness as a major objective. In fact, one comparison group teacher predicted that her students would show <u>greater</u> gain, since her students were out exercising while pilot students were at their desk part of each morning learning about fitness concepts.

"I've nothing against physical fitness, Rosemary, but you're turning into a jock."

Health/Physical Fitness Concepts

The Scott-Foresman Health Test was administered to both groups to obtain a measure of health/physical fitness concept knowledge. Both groups improved their test scores from the pre-test to the post-test. Although the norms were developed from students who had had a health course just prior to taking the test, both summer groups' pre-test scores were at the fiftieth percentile. On the post-test, pilot students showed a mean raw score increase of 2.78, as contrasted to 1.33 for the comparison group (see Table 2), with experimental students climbing to the sixtieth percentile and comparison students moving up to the fifty-third percentile.

Table 2

KNOWLEDGE OF HEALTH CONCEPTS

(Mean Score Out of Possible 60)

	Comparison (N = 60)		Pilot (N = 65)	
	Pre	Post	Pre	Post
Mean # of Scott-Foresman items correct	30.52	31.85	31.45	34.23
Change in score	+1.33		+2.78	

Again, despite the pilot group's apparent growth advantage, the difference between the two groups' improvement was not found to be statistically significant. Examination of the pilot teachers' own written tests revealed that there was not as much congruence of the Scott-Foresman with the delivered curriculum as originally anticipated. A teacher-made instrument, specifically addressing the objectives of the APS project, might prove to be a better measure of the concepts learned during subsequent summer sessions.

The Rhode Island Teen Wellness Check was administered to both groups to obtain a self-reported measure of the health risk factors and behaviors that are most relevant to teenagers. The lifestyle score which results from this checklist is a composite ranging from 0 to 100, with 100 being the "healthiest" score. Both groups fell into the "fair" category (71 to 84 = fair) on mean lifestyle scores for pre- and post-test measures (see Table 3).

Table 3

LIFESTYLE SCORES

	Comparison (N = 77)		Pilot (N = 71)	
	Pre	Post	Pre	Post
Mean lifestyle score	81.9	84.4	83.6	84.5
Change in score	+2.5		+0.9	

"I'm sure you're right, but I never decide anything when I'm in the middle of a sugar buzz."

While the comparison group showed the greater gain in this instance, the difference was found not to be statistically significant. In addition to the total lifestyle score, the Teen Wellness Check also provided indications of individual negative and positive health-related behaviors. Please see Table 4 for a breakdown of behaviors and percentages for pilot and comparison students who completed both the pre- and post-test Wellness Checks.

Table 4

HEALTH-RELATED BEHAVIORS

	Pilot		Comparison	
Positive Statements	Pre	Post	Pre	Post
1. Do not smoke	91.9%	90.3%	80.5%	86.1%
2. Do not drink	90.3%	95.2%	72.2%	86.1%
3. Good auto safety habits	69.4%	74.2%	63.9%	66.7%
4. Exercises regularly	48.4%	59.7%	61.1%	66.6%
5. Good dental habits	35.5%	46.8%	38.8%	38.8%
6. Good nutrition habits	14.5%	24.2%	11.1%	25.0%
Negative Statements				
1. Takes unnecessary personal risks	67.7%	59.7%	80.6%	66.7%
2. Too much stress	64.5%	53.2%	55.6%	47.2%
3. Family history of CHD or diabetes	51.6%	56.5%	41.4%	50.0%
4. Consumes too much sugar	29.0%	29.0%	25.0%	19.4%
5. Poor dental health habits	64.5%	53.2%	63.8%	58.3%
6. Not up to date on immunizations	56.5%	40.3%	36.1%	33.3%
7. No regular exercise program	53.2%	40.3%	44.4%	33.3%
8. Depressed	12.9%	9.7%	11.1%	11.1%

Students in both pilot and comparison groups demonstrated more desirable choices on all positive and negative items except the items regarding smoking and family history. The noticeable change in the students' responses regarding family history of coronary heart disease (CHD) or diabetes could mean that student awareness regarding these concerns increased this summer.

Blood Chemistry

Although blood chemistry was measured on only the pilot students, there are some interesting results from this adolescent population. Studies have shown that an increase in high density lipoprotein (HDL) and triglycerides often occurs after participating in physical fitness programs that incorporate endurance-type exercises. Less is known about how much effect exercise has on cholesterol and glucose levels because of other risk factors associated with coronary heart disease (CHD).

Desired effects would have been increased HDL levels and decreased cholesterol, triglycerides and glucose. As displayed in Table 5, while HDL levels went up and cholesterol levels declined somewhat, the changes were not appreciable. Triglycerides elevated substantially, a move in the wrong direction, but this may be due to lack of adherence to required fasting conditions prior to the testing. The drop in glucose levels is heartening.

Table 5

BLOOD CHEMISTRY
(N = 62)

	HDL	CHOL	TRIG	GLUC
Pilot pre mean	40.1	163.5	67.5	92.1
Pilot post mean	42.5	161.2	83.7	81.5
National age group mean	51.25	156.5	73.5	100.0

At a National Institutes of Health Consensus Development Conference entitled "Lowering Blood Cholesterol," (December 12, 1984) it was agreed that for individuals two to nineteen years of age, a serum cholesterol level of 185 mg/dL or higher should be considered in the high risk category (Strong, 1985).

On the pre-measure, approximately one-quarter (26%) of the pilot students were found to be "high risk" in terms of cholesterol level. The mean for these 16 students actually went up 2.62 mg/dL by the post measurement. On the other hand, the 46 students whose levels were "normal" showed a decline of 3.67 mg/dL! In other words, it is the high risk students whose overall cholesterol levels increased during the program, while the normal students' cholesterol levels decreased slightly. This information poses questions about interventions that can work for both the normal and the high risk adolescent. The issue of who should be treated for hypercholesterolemia and how and when still remains.

Those involved in the development of the program suggest that blood pressure, a vital element on which all should keep tabs, be measured as part of the pre-post physical battery next summer. This would serve both educational and assessment purposes.

"Look out! Here comes Denis Farnell and his 'wellness unto death.'"

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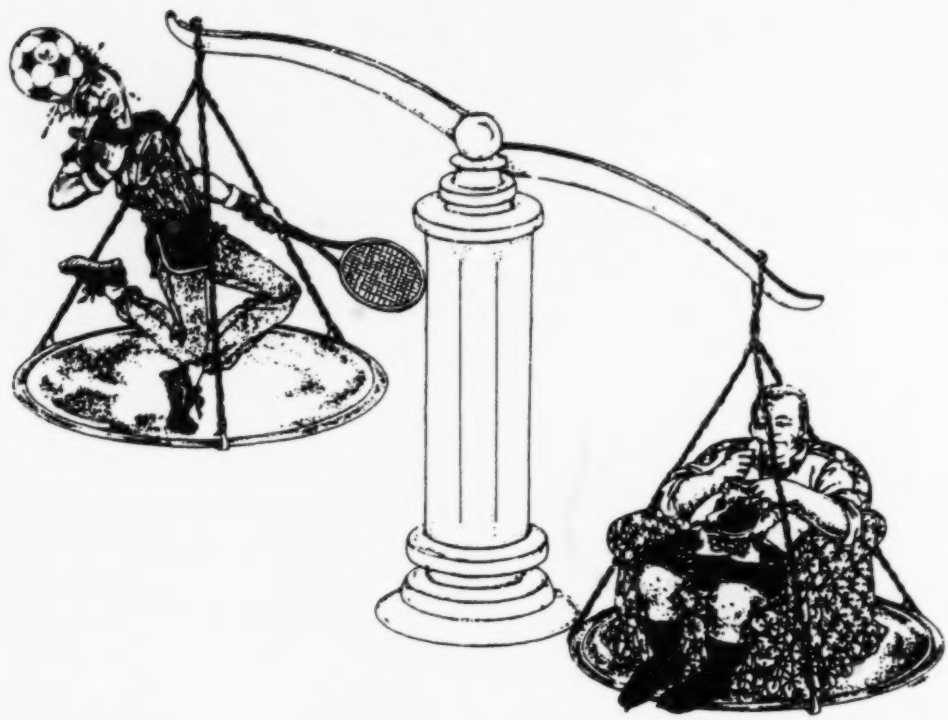
EVALUATION UPDATE:

ALBUQUERQUE PUBLIC SCHOOLS - LOVELACE

PHYSICAL FITNESS PILOT PROGRAM

"HEALTHFUL P.E."



PLANNING, RESEARCH AND ACCOUNTABILITY

ALBUQUERQUE PUBLIC SCHOOLS

NOVEMBER, 1987

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ALBUQUERQUE PUBLIC SCHOOLS

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NOVEMBER, 1987

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ADMINISTRATIVE SUMMARY

The Lovelace Medical Foundation and the Albuquerque Public Schools are working cooperatively on a three-year physical fitness pilot program. For the past two summers, one class at each of the three summer school sites has been involved. The goal is to develop a course that will inform students about healthy lifestyles and motivate them toward improved lifelong fitness habits.

The results after the first two summers of implementation are encouraging. On surveys administered at the end of the summer sessions, most pilot students have disclosed that "it's the best course I've ever taken." Pilot students have also avowed more learning than comparison students have indicated. Pilot and comparison groups have been pre and posttested each summer, too, with the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD) health-oriented fitness assessment. Although the pilot students have shown more growth each summer, the differences in gain were not found to be statistically significant. In each year, both groups moved from the "below average" classification to the "average" category. The Rhode Island Teen Wellness Check is also administered each summer to both groups to obtain a measure of self-reported health risk factors. While the pilot groups mean exit score exceeded that of the comparison group each year, all groups began and finished in the "fair" range.

The differences in progress shown on a health/physical fitness concepts test were ascertained to be statistically significant, with pilot students showing three times as much gain from pre to post administration.

Biophysical measures were only performed for pilot students. The blood tests revealed a rise in high density lipoprotein (HDL) amounts and a drop in glucose levels that are heartening.

The final year of this pilot project will be used to fine tune the program components, including a field testing with some teachers new to this offering. The noteworthy components of this summer project will be inserted into the regular APS required high school physical education program upon its completion and thorough evaluation.

INTRODUCTION

During the past two summers, the Lovelace Medical Foundation (LMF) and the Albuquerque Public Schools (APS) have collaborated on a physical fitness pilot program. Offered as an alternative to the APS summer school version of the required high school physical education course, the program has served one class at each of the three high school summer sites. The primary objective has been to develop an educational program aimed at promoting positive health-related behaviors, in the belief that early education and intervention will generate long-term patterns resulting in improved life-long fitness habits and health status.

National study findings indicate that New Mexico's school age population is lacking in physical fitness skills and activities. Physical fitness testing in the 1986-87 school year resulted in speed, endurance, and agility scores that were well below national norms that were, themselves, generally regarded as disappointing.

New Mexico is not meeting minimum recommended physical education requirements in the public schools as noted in a 1985 survey by the American Alliance for Health, Physical Education, Recreation and Dance. New Mexico students are required to take a total of 18,468 minutes of physical education from kindergarten through twelfth grade, or an average of about 39 minutes per week.

During the last decade, the concept of what "physical fitness" means has undergone a major change. Traditionally, the "physically fit" child was one who had obvious motor (or athletic) abilities, ordinarily defined by such parameters as muscle strength, agility, speed and power. But the high levels of power, speed, and agility necessary for success in most competitive sports have little or no relevance in the daily lives of most adults. Today, the words "physical fitness" imply optimal functioning of all physiological systems of the body, particularly the cardiovascular, pulmonary, and musculoskeletal systems.

Unfortunately, just as the understanding of the importance of health-related physical fitness has become widespread, the ability to direct youth activities toward fitness has been countered by several new pressures:

1. Financial constraints have caused many public school systems to reduce physical education budgets.

2. Widespread disenchantment with the results of several decades of "progressive education experiments" has resulted in pressures on school administrators to do away with "frills" and to return to the "basics;" this too has led to de-emphasis of physical education classes.

3. Children and adolescents are lured to watch television in their spare time.

4. Finally, most aerobic activities (e.g. running, swimming laps) are not perceived to be pleasurable, and it is extremely difficult to motivate children to begin a lifelong habit of maintaining a high degree of

physical fitness if this involves repeated endurance physical activities.

In recent years concern had been expressed by educators and parents over the APS summer school physical education course, partially because its emphasis has been on non-aerobic recreational activities. The district physical education evaluation study, completed in 1985, pointed to the need for more physical fitness concepts and exercises during the regular term offering as well. It appeared that prevailing efforts were unlikely to yield long-lasting impacts on health attitudes and behaviors. The education and research units of the Lovelace Medical Foundation graciously offered considerable time, and approximately $12,000 per year in funding, to pilot a "Healthful PE" summer program with the Albuquerque Public Schools.

The project is a three-year program. After it is completed and evaluated in 1988, components of the program will be considered for incorporation into the required high school physical education course. This report presents preliminary findings for the first two years.

DRABBLE
I CAN'T BELIEVE SUMMER VACATION IS ALMOST OVER.
8-3
WHAT HAVE WE DONE SO FAR?
WELL, WE'VE WATCHED TV, HUNG AROUND THE MALL, AND GOOFED-OFF!
THAT'S GOOD. I WAS AFRAID WE'D BEEN WASTING OUR TIME!

THE PROGRAM

In both 1986 and 1987 ninth through twelfth grade summer enrollees self-selected into pilot or comparison group classrooms at each of the three sites. Participation in the pilot program was strictly voluntary, with the choice provided at summer school registration. While the students were distinct each session, the three teachers of the pilot program were the same both summers. All three teachers are well-regarded and are experienced and credentialed in both physical education and health. Their quality, ironically, presents some impediments in assessing the pilot. It is difficult to delineate how much credit to attribute to the merits of the curriculum versus how much to ascribe to preeminent teaching.

While students in the pilot group differed significantly from the comparison group in age and grade level during the summer of 1986, no such differences were found in 1987. The initial disparity was due to some "recruitment" of younger students for the pilot under the assumption that working with them might be more effective in promoting long-term positive health-related change. It appeared less likely that younger students would have incorporated negative health behaviors into their lifestyles and more likely that they would be malleable. The table below depicts the more equal distribution of students by grade during the summer of 1987:

SUMMER SUBJECTS, 1987
GROUP BY GRADE TO BE ENTERED 1987-88

GRADE	PILOT	COMPARISON	TOTAL
NINTH	44	50	94
TENTH	12	14	26
ELEVENTH	7	7	14
TWELFTH	7	8	15
	70	79	149

The two groups were also better matched in terms of gender in 1987. In 1986, females comprised 67% of the pilot population and 54% of the comparison groups. The percentages of girls were 64% and 62%, respectively, during the summer of 1987.

The teachers were paid by LMF to develop the curriculum and activities prior to each summer. While this planning was a true advantage in comparison to other summer school teaching slots, it is, nevertheless, felt by the project steering committee that even more advance time is necessitated for properly shaping the course. The teachers have already begun to work this fall to put the curriculum into a structured written form, and design the summer, 1988 offering.

The six week program, with daily sessions (Monday through Friday) of four hours, is divided into sections, each of which addresses health-related areas of adolescence. Information and skills are presented and then applied to

health-related behaviors. Areas covered by the program have included: components of fitness, wellness concepts, health knowledge, hypokinetic disease and conditions, threshold training and target zones of exercise, muscular endurance and strength, flexibility, body composition and chemistry, individual and group aerobic and anaerobic activities, alcohol and substance abuse, stress, and nutrition. Students apply and practice the elements in various activities.

The comparison group classes participated in the traditional summer school physical education curriculum offered by APS, during the same timeframe. Included in these classes were the teaching and practice of physical activities (aerobic, anaerobic and team sports). During the summer of 1986, many comparison students spent much of the time off-campus, involved in activities such as bowling and miniature golf. Due to the inherent transportation and expense problems, such ventures were not permitted in 1987, purportedly resulting in more fitness-oriented activities for the comparison group than in the past.

WIZARD OF ID
YOUR TEETH ARE IN TERRIBLE SHAPE! HOW DID THEY GET THIS WAY?
...IT'S SPORTS RELATED
YOU'RE AN ATHLETE?
NO... I'VE COLLECTED OVER TWENTY THOUSAND BASEBALL CARDS

EVALUATION RESULTS

Pre and post concepts tests, physical fitness measures and health risk appraisals were administered both summers to pilot and comparison students. Additional pre and post blood chemistry diagnoses were performed for pilot students. An adaptation of the student survey form that had been used in the district physical education evaluation was administered to both pilot and comparison groups at the end of the first summer. The opinions were so clear-cut that, in order to cut down on the data gathering, it was not planned to repeat the surveying during the summer of 1987. One pilot teacher, however, was so interested in such feedback that she administered the same instrument on her own, and thus, the results will be included here.

Student Impressions

Some of the most favorable information about the pilot program came in the form of feedback from the students. 1986 responses indicated much greater satisfaction with, and appreciation for, the pilot than the comparison experience. The summary below, from the 1987 group at West Mesa, is strikingly similar to the perceptions gathered from the 1986 polling of all three pilot groups.

Pilot students believed that more than one-third of the PE program should be devoted to learning about fitness and practicing fitness activities. It was unanimous among those surveyed in 1987 that they had learned "a lot" about fitness. Seventy-seven percent stated about the Lovelace/APS effort that "it's the best class I've ever taken." The remainder of the group opted for "I like it a lot." All but one student would "definitely" recommend "Healthful PE" to friends as an option to the required PE course. That it is fun, that one learns a lot, that a variety of activities are offered, and that one gets to know a lot of new friends in a close "family atmosphere" are all reasons reiterated for endorsing the program.

GARFIELD
OKAY, STAND UP STRAIGHT AND PUT YOUR HANDS ON YOUR HIPS
THOSE OF YOU TOO FAT TO FIND YOUR HIPS JUST GIVE IT YOUR BEST GUESS
I HATE SARCASTIC FITNESS INSTRUCTORS
JIM DAVIS 4-8

Fitness Testing

During each summer, both groups were pre and posttested with the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD) health-oriented fitness assessment. The total fitness score is a composite of the various measures (weight, sit and reach, sit-ups, skinfold measurement, and time required to complete a 1.5 mile run).

National norms for measurement of total physical fitness from the test results are: 234+ = excellent; 211-233 = above average; 191-210 = average; 167-190 = below average; 0-166 = well below average. In each year, both groups shifted from below average to average from pretest to posttest.

TOTAL FITNESS SCORES

	Comparison Group				Pilot Group			
Mean Fitness Score	N	Pre	Post	Gain	N	Pre	Post	Gain
1986	59	187.7	197.8	10.1	67	184.1	202.3	18.2
1987	47*	188.7	204.3	15.6	65	184.9	201.5	16.6

*Problems with test administration caused one comparison class' scores to be invalidated.

Although the pilot students showed more growth each summer, the differences in gain were not found to be statistically significant. Attempts to measure the fitness retention of both groups of 1986 students, by retesting in the spring of 1987, were unsuccessful, since too few students were available. Agreements have already been made for the 1987 students to take the test again during the summer of 1988.

Further analyses of the physical fitness measures permit breakout for weight loss, skinfold measure (% bodyfat), sit and reach scores (flexibility), sit-up scores, and 1.5 mile run time. Both groups showed improvement both years from pre to post measurement, except for the control group in skinfold (1986) and weight loss (1987). Although in most cases, the pilot groups' differences on measures of cardiovascular fitness were more pronounced than the comparison groups', the amount of those differences were not, in any instance, statistically significant. It should be noted that some comparison group classes have also begun to consider fitness to be a major objective. In fact, one comparison group teacher predicted that her students would show <u>greater</u> gain, since her students were out exercising while pilot students were at their desk part of each morning learning about fitness concepts.

DRABBLE
I'M LOOKING FOR A GOOD HEALTH AND FITNESS BOOK.
IT'S HARD TO CHOOSE BECAUSE THERE ARE SO MANY ON THE MARKET!
DIET
HOW CAN YOU TELL WHICH HEALTH AND FITNESS BOOK IS THE BEST?
FOR STARTERS, FIND ONE BY AN AUTHOR WHO IS STILL ALIVE.

Concepts Testing

In 1986, the Scott, Foresman Health Test was administered to both groups to obtain a measure of health/physical fitness concept knowledge. Both groups improved their test scores from the pretest to the posttest. Although the norms were developed from students who had had a health course just prior to taking the test, both summer groups' pretest scores were at the fiftieth percentile. On the posttest, pilot students showed a mean raw score increase of 2.78, as contrasted to 1.33 for the comparison group, with experimental students climbing to the sixtieth percentile and comparison students moving up to the fifty-third percentile.

Again, despite the pilot group's apparent growth advantage, the difference between the two groups' improvement was not found to be statistically significant. Examination of the pilot teachers' own written tests revealed that there was not as much congruence of the Scott, Foresman with the delivered curriculum as originally anticipated. It was agreed that a teacher-made instrument, specifically addressing the objectives of the APS project, might prove to be a better measure of the concepts learned during subsequent summer sessions.

Prior to the beginning of the 1987 summer session, the three pilot teachers received a brief orientation to test theory and item-writing. They then contributed to an item pool which was edited by the health and physical education curriculum coordinators as well as the program evaluator. The pretest contained fifty items. After examination of the item analysis, twenty items were dropped as "non-discriminating" in that two-thirds or more of the students, without instruction, were already responding correctly. The remaining thirty items served as the pre-post measure with an additional ten items field-tested as part of the post-administration. The results of the thirty-item measure are portrayed below:

CONCEPTS TEST (Maximum Score = 30)

	N	Pretest	Posttest	Gain
Comparison Students	47	8.0	9.6	1.6
Pilot Students	62	8.2	13.1	4.9

T-tests indicate that the differences in gain between the pilot and control groups are statistically significant ($p < .01$). While the exit level scores of the pilot students are somewhat disappointing, it must be pointed out that the teachers were instructed to create a challenging measure and easier items were eliminated after the pretest. The instrument will be revised again by the teachers this winter, based on the posttest item analysis.

Funky Winkerbean
by Tom Batiuk
YOU'LL HAVE TEN MINUTES TO FINISH THIS TEST!
DEFINE THE FOLLOWING:
(1.) CHOLESTEROL
A substance in the bloodstream that causes you to eat salads!
BATIUK

Health Risk Factors

The Rhode Island Teen Wellness Check was administered each summer to both groups to obtain a measure of the self-reported health risk factors and behaviors that are most relevant to teenagers. The lifestyle score is a total score ranging from 0 to 100 (100 being the optimal score).

WELLNESS CHECK LIFESTYLE SCORES

	Comparison Group			Pilot Group		
Mean Lifestyle Score	Pre	Post	Change	Pre	Post	Change
1986	81.9	84.4	+2.5	83.6	84.5	+0.9
1987	81.9	81.0	-0.9	81.0	84.0	+3.0

Both groups' pre and post scores in each year fell into the "fair" norm (71 to 84 = fair). The pilot group's exit scores exceeded those of the comparison group in both years, although the comparison group did register a more positive change during the initial summer. It is noteworthy that, in 1987, the pilot students reported themselves as having fewer health risks after receiving the program, while the comparison students perceived themselves as having more!

In addition to the total lifestyle score, the Teen Wellness Check responses can be compiled to indicate the relative health risks regarding each individual behavior. During both summers, the percentage of pilot students reporting "participation in a regular exercise program" increased much more than for the comparison students. The percentage of pilot students recounting good nutrition habits also improved noticeably.

SHOE
I HATE DIETING...
WATCHING WHAT I EAT... GETTING ENOUGH EXERCISE, WEIGHING MYSELF EVERY MORNING...
RIGHT...
A WAIST IS A TERRIBLE THING TO MIND.

The responses of the 1987 pilot group students are summarized below. It is important to note that this is based on self-reported health behaviors which cannot be verified in terms of actual practice.

WELLNESS CHECK SUMMARY

Pilot Group - 1987

Positive Behaviors	Pre Percentage	Post Percentage	Change
Do Not Smoke	89.4	89.1	-.3
Do Not Drink	77.3	81.2	+3.9*
Good driving habits	25.0	21.1	-3.9
Regular exercise	53.0	79.7	+26.7*
Good dental habits	93.9	91.9	-2.0
Good nutrition habits	22.7	41.9	+19.2*
Negative Behaviors			
Takes unnecessary personal risks	21.9	14.1	-7.8*
Too much stress	24.2	17.2	-7.0*
Family history of CHD or diabetes	39.4	48.4	+9.0
Consumes too much sugar	48.5	38.7	-9.8*
Out-of-date immunizations	31.8	23.4	-8.4*
Depressed	25.7	21.9	-3.8*

*Denotes a positive direction change

FUNKY WINKERBEAN
I'M TAKING A SURVEY, MA'M ... DID YOU KNOW THAT SCIENTISTS HAVE DISCOVERED A FIFTH BASIC FOOD GROUP?
OH REALLY? WHAT IS IT?
BAND CANDY!

Blood Analysis

Biophysical measures were only performed for pilot students. Studies have shown that an increase in high density lipoprotein (HDL) and triglycerides often occurs after participating in physical fitness programs that incorporate endurance-type exercises. Less is known about how much effect exercise has on cholesterol and glucose levels because of other risk factors associated with coronary heart disease (CHD). Desired effects would have been increased HDL levels and decreased cholesterol, triglycerides and glucose.

BLOOD CHEMISTRY

	HDL		CHOLESTEROL		TRIGLYCERIDES		GLUCOSE	
	1986	1987	1986	1987	1986	1987	1986	1987
Pilot pre mean	40.1	39.5	163.5	159.9	67.5	72.8	92.1	97.3
Pilot post mean	42.5	46.7	161.2	161.5	83.7	65.3	81.5	84.4
National age group mean	51.25		156.5		73.5		100.0	

The rise in HDL and the drop in glucose levels are most heartening. While the triglyceride decline in 1987 is a move in the proper direction, the cholesterol reversal from 1986 is negative.

In measuring mean differences for 1987 analyses, using paired-comparisons t-tests, significant changes were noted in HDL levels ($p < .01$); LDL levels ($p < .04$); Cholesterol:HDL ratio ($p < .001$); LDL:HDL ratio ($p < .005$); and glucose ($p < .007$).

C'Barsotti

"Take your time. Breakfast is the most important meal of the day."

IMPLICATIONS FOR THE FUTURE

Although there have been some significant changes during the course of this study, there are several variables that have not changed significantly, although they have improved. It may be that a six-week program (with only five weeks between pre and posttesting) is too short to show marked advancement. It may also be due to a variety of measurement problems still to be resolved.

The noteworthy components of this program will be inserted into the regular APS required high school physical education program after the pilot is completed and thoroughly evaluated. The recommendations from the first year to include within the program individualized behavioral objective projects and blood pressure measurement were somewhat incorporated. The third and final year will be used to fine tune the program components, including a field testing with some teachers new to this offering. Overall, the prime purpose will continue to be to help develop positive health-related behaviors and promote the continuation of such behaviors throughout the students' lives. Further meetings between Lovelace and APS personnel are planned to finalize the third year curriculum, to ensure follow-up measurement, and to consider and discuss modifications of the regular school year APS high school program.